Claims

What is claimed is:

1. An apparatus, comprising:
a zonal isolation assembly comprising:
one or more solid tubular members, each solid tubular member including one or more external seals; and
one or more perforated tubular members coupled to the solid tubular members; and
a shoe coupled to the zonal isolation assembly;
wherein one or more of the perforated tubular members include an elastic sealing member coupled to the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

2. The apparatus of claim 1, wherein the elastic sealing member comprises a tubular elastic sealing member.

3. The apparatus of claim 1, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

4. The apparatus of claim 1, wherein one or more of the external seals comprise a swellable elastomeric sealing member that swells in the presence of fluidic materials.

5. The apparatus of claim 1, wherein the zonal isolation assembly further comprises:
one or more intermediate solid tubular members coupled to and interleaved among the perforated tubular members, each

intermediate solid tubular member including one or more external seals.

6. The apparatus of claim 1, wherein the zonal isolation assembly further comprises one or more valve members for controlling the flow of fluidic materials between the tubular members.

7. The apparatus of claim 5, wherein one or more of the intermediate solid tubular members include one or more valve members.

8. An apparatus, comprising:

a zonal isolation assembly comprising:

one or more primary solid tubulars, each primary solid tubular including one or more external seals;

n perforated tubulars coupled to the primary solid tubulars; and

n-1 intermediate solid tubulars coupled to and interleaved among the perforated tubulars, each intermediate solid tubular including one or more external seals; and

a shoe coupled to the zonal isolation assembly;

wherein one or more of the perforated tubular members include an elastic sealing member coupled to the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

9. The apparatus of claim 8, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

10. The apparatus of claim 8, wherein one or more of the external seals comprise a swellable elastomeric sealing member that swells in the presence of fluidic materials.

11. A method of isolating a first subterranean zone from a second subterranean zone in a wellbore, comprising:

positioning one or more primary solid tubulars within the wellbore, the primary solid tubulars traversing the first subterranean zone;

positioning one or more perforated tubulars within the wellbore, the perforated tubulars traversing the second subterranean zone;

fluidicly coupling the perforated tubulars and the primary solid tubulars;

preventing the passage of fluids from the first subterranean zone to the second subterranean zone within the wellbore external to the solid and perforated tubulars; and

covering one or more of the perforations of one or more of the perforated tubular members using an elastic sealing member.

12. The method of claim 11, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

13. A method of extracting materials from a producing subterranean zone in a wellbore, at least a portion of the wellbore including a casing, comprising;

positioning one or more primary solid tubulars within the wellbore;

fluidicly coupling the primary solid tubulars with the casing;

positioning one or more perforated tubulars within the wellbore, the perforated tubulars traversing the producing subterranean zone;

fluidicly coupling the perforated tubulars with the primary solid tubulars;

fluidicly isolating the producing subterranean zone from at least one other subterranean zone within the wellbore;

fluidicly coupling at least one of the perforated tubulars with the producing subterranean zone; and

covering one or more of the perforations of one or more of the perforated tubular members using an elastic sealing member.

14. The method of claim 13, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

15. The method of claim 13, further comprising:

controllably fluidicly decoupling at least one of the perforated tubulars from at least one other of the perforated tubulars.

16. An apparatus, comprising:

a subterranean formation including a wellbore;

a zonal isolation assembly at least partially positioned within the wellbore comprising:

one or more solid tubular members, each solid tubular member including one or more external seals; and

one or more perforated tubular members coupled to the solid tubular members; and

a shoe positioned within the wellbore coupled to the zonal isolation assembly;

wherein at least one of the solid tubular members and the perforated tubular members are formed by a radial expansion process performed within the wellbore; and

wherein one or more of the perforated tubular members include an elastic sealing member coupled to the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

17. The apparatus of claim 16, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

18. The apparatus of claim 16, wherein one or more of the external seals comprise a swellable elastomeric sealing member that swells in the presence of fluidic materials.

19. The apparatus of claim 16, wherein the zonal isolation assembly further comprises:

one or more intermediate solid tubular members coupled to and interleaved among the perforated tubular members, each intermediate solid tubular member including one or more external seals;

wherein at least one of the solid tubular members, the perforated tubular members, and the intermediate solid tubular members are formed by a radial expansion process performed within the wellbore.

20. The apparatus of claim 16, wherein the zonal isolation assembly further comprises one or more valve members for controlling the flow of fluids between the solid tubular members and the perforated tubular members.

21. The apparatus of claim 19, wherein one or more of the intermediate solid tubular members include one or more valve members for controlling the flow of fluids between the solid tubular members and the perforated tubular members.

22. An apparatus, comprising:

a subterranean formation including a wellbore;

a zonal isolation assembly positioned within the wellbore comprising:

one or more primary solid tubulars, each primary solid tubular including one or more external seals;

n perforated tubulars positioned coupled to the primary solid tubulars; and

n-1 intermediate solid tubulars coupled to and interleaved among the perforated tubulars, each intermediate solid tubular including one or more external seals; and

a shoe coupled to the zonal isolation assembly;

wherein at least one of the primary solid tubulars, the perforated tubulars, and the intermediate solid tubulars are formed by a radial expansion process performed within the wellbore; and

wherein one or more of the perforated tubular members include an elastic sealing member coupled to the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

23. The apparatus of claim 22, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

24. The apparatus of claim 22, wherein one or more of the external seals comprise a swellable elastomeric sealing member that swells in the presence of fluidic materials.

25. A method of isolating a first subterranean zone from a second subterranean zone in a wellbore, comprising:

positioning one or more primary solid tubulars within the wellbore, the primary solid tubulars traversing the first subterranean zone;

positioning one or more perforated tubulars within the wellbore, the perforated tubulars traversing the second subterranean zone;

radially expanding at least one of the primary solid tubulars and perforated tubulars within the wellbore;

fluidicly coupling the perforated tubulars and the primary solid tubulars;

preventing the passage of fluids from the first subterranean zone to the second subterranean zone within the wellbore external to the primary solid tubulars and perforated tubulars; and

covering one or more of the perforations of one or more of the perforated tubular members using an elastic sealing member.

26. The method of claim 25, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

27. A method of extracting materials from a producing subterranean zone in a wellbore, at least a portion of the wellbore including a casing, comprising;

positioning one or more primary solid tubulars within the wellbore;

positioning one or more perforated tubulars within the wellbore, the perforated tubulars traversing the producing subterranean zone;

radially expanding at least one of the primary solid tubulars and the perforated tubulars within the wellbore;

fluidicly coupling the primary solid tubulars with the casing;

fluidicly coupling the perforated tubulars with the primary solid tubulars;

fluidicly isolating the producing subterranean zone from at least one other subterranean zone within the wellbore;

fluidicly coupling at least one of the perforated tubulars with the producing subterranean zone; and

covering one or more of the perforations of one or more of the perforated tubular members using an elastic sealing member.

28. The method of claim 27, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

29. The method of claim 27, further comprising:

controllably fluidicly decoupling at least one of the perforated tubulars from at least one other of the perforated tubulars.

30. An apparatus, comprising:

a subterranean formation including a wellbore;

a zonal isolation assembly positioned within the wellbore comprising:

n solid tubular members positioned within the wellbore, each solid tubular member including one or more external seals; and

n-1 perforated tubular members positioned within the wellbore coupled to and interleaved among the solid tubular members; and

a shoe positioned within the wellbore coupled to the zonal isolation assembly;

wherein one or more of the perforated tubular members include a tubular elastic sealing member coupled to the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

31. The apparatus of claim 30, wherein the elastic sealing member comprises a swellable elastomeric sealing member that swells in the presence of fluidic materials.

32. The apparatus of claim 30, wherein one or more of the external seals comprise a swellable elastomeric sealing member that swells in the presence of fluidic materials.

33. The apparatus of claim 30, wherein the zonal isolation assembly further comprises one or more valve members for controlling the flow of fluids between the solid tubular members and the perforated tubular members.

34. The apparatus of claim 30, wherein one or more of the solid tubular members include one or more valve members for controlling the flow of fluids between the solid tubular members and the perforated tubular members.

35. A system for isolating a first subterranean zone from a second subterranean zone in a wellbore, comprising:

means for positioning one or more primary solid tubulars within the wellbore, the primary solid tubulars traversing the first subterranean zone;

means for positioning one or more perforated tubulars within the wellbore, the perforated tubulars traversing the second subterranean zone;

means for fluidicly coupling the perforated tubulars and the primary solid tubulars;

means for preventing the passage of fluids from the first subterranean zone to the second subterranean zone within the wellbore external to the primary solid tubulars and the perforated tubulars; and

means for sealing one or more of the perforations of one or more of the perforated tubular members.

36. A system for extracting materials from a producing subterranean zone in a wellbore, at least a portion of the wellbore including a casing, comprising;

means for positioning one or more primary solid tubulars within the wellbore;

means for fluidicly coupling the primary solid tubulars with the casing;

means for positioning one or more perforated tubulars within the wellbore,

the perforated tubulars traversing the producing subterranean zone;

means for fluidicly coupling the perforated tubulars with the primary solid tubulars;

means for fluidicly isolating the producing subterranean zone from at least one other subterranean zone within the wellbore;

means for fluidicly coupling at least one of the perforated tubulars with the producing subterranean zone; and

means for sealing one or more of the perforations of one or more of the perforated tubular members using an elastic sealing member.

37. The system of claim 36, further comprising:

means for controllably fluidicly decoupling at least one of the perforated tubulars from at least one other of the perforated tubulars.

38. A system for isolating a first subterranean zone from a second subterranean zone in a wellbore, comprising:

means for positioning one or more primary solid tubulars within the wellbore, the primary solid tubulars traversing the first subterranean zone;

means for positioning one or more perforated tubulars within the wellbore, the perforated tubulars traversing the second subterranean zone;

means for radially expanding at least one of the primary solid tubulars and perforated tubulars within the wellbore;

means for fluidicly coupling the perforated tubulars and the primary solid tubulars;

means for preventing the passage of fluids from the first subterranean zone to the second subterranean zone within the wellbore external to the primary solid tubulars and perforated tubulars; and

means for sealing one or more of the perforations of one or more of the perforated tubular members using an elastic sealing member.

39. A system for extracting materials from a producing subterranean zone in a wellbore, at least a portion of the wellbore including a casing, comprising;

means for positioning one or more primary solid tubulars within the wellbore;

means for positioning one or more perforated tubulars within the wellbore, the perforated tubulars traversing the producing subterranean zone;

means for radially expanding at least one of the primary solid tubulars and the perforated tubulars within the wellbore;

means for fluidicly coupling the primary solid tubulars with the casing;

means for fluidicly coupling the perforated tubulars with the solid tubulars;

means for fluidicly isolating the producing subterranean zone from at least one other subterranean zone within the wellbore;

means for fluidicly coupling at least one of the perforated tubulars with the producing subterranean zone; and

means for sealing one or more of the perforations of one or more of the perforated tubular members using an elastic sealing member.

40. The system of claim 39, further comprising:

means for controllably fluidicly decoupling at least one of the perforated tubulars from at least one other of the perforated tubulars.

41. A system for isolating subterranean zones traversed by a wellbore, comprising:

a tubular support member defining a first passage;

a tubular expansion cone defining a second passage fluidicly coupled to the first passage coupled to an end of the tubular support member and comprising a tapered end;

a tubular liner coupled to and supported by the tapered end of the tubular expansion cone; and

a shoe defining a valveable passage coupled to an end of the tubular liner;

wherein the tubular liner comprises:

one or more expandable tubular members that each comprise:

a tubular body comprising an intermediate portion and first and second expanded end portions coupled to opposing ends of the intermediate portion; and

a sealing member coupled to the exterior surface of the intermediate portion; and

one or more perforated tubular members coupled to the expandable tubular members;

wherein the inside diameters of the perforated tubular members are greater than or equal to the outside diameter of the tubular expansion cone.

42. The system of claim 41, wherein the wall thicknesses of the first and second expanded end portions are greater than the wall thickness of the intermediate portion.

43. The system of claim 41, wherein each expandable tubular member further comprises:

a first tubular transitionary member coupled between the first expanded end portion and the intermediate portion; and

a second tubular transitionary member coupled between the second expanded end portion and the intermediate portion;

wherein the angles of inclination of the first and second tubular transitionary members relative to the intermediate portion ranges from about 0 to 30 degrees.

44. The system of claim 41, wherein the outside diameter of the intermediate portion ranges from about 75 percent to about 98 percent of the outside diameters of the first and second expanded end portions.

45. The system of claim 41, wherein the burst strength of the first and second expanded end portions is substantially equal to the burst strength of the intermediate tubular section.

46. The system of claim 41, wherein the ratio of the inside diameters of the first and second expanded end portions to the interior diameter of the intermediate portion ranges from about 100 to 120 percent.

47. The system of claim 41, wherein the relationship between the wall thicknesses t_1, t_2, and t_{INT} of the first expanded end portion, the second expanded end portion, and the intermediate portion, respectively, of the expandable tubular members, the inside diameters D_1, D_2 and D_{INT} of the first expanded end portion, the second expanded end portion, and the intermediate portion, respectively, of the expandable tubular members, and the inside diameter $D_{wellbore}$ of the wellbore casing that the expandable tubular member will be inserted into, and the outside diameter D_{cone} of the expansion cone that will be used to radially expand the expandable tubular member within the wellbore is given by the following expression:

$$Dwellbore - 2 * t_1 \geq D_1 \geq \frac{1}{t_1}\left[(t_1 - t_{INT}) * D_{cone} + t_{INT} * D_{INT}\right];$$

wherein $t_1 = t_2$; and wherein $D_1 = D_2$.

48. The system of claim 41, wherein the tapered end of the tubular expansion cone comprises:

a plurality of adjacent discrete tapered sections.

49. The system of claim 48, wherein the angle of attack of the adjacent discrete tapered sections increases in a continuous manner from one end of the tubular expansion cone to the opposite end of the tubular expansion cone.

50. The system of claim 41, wherein the tapered end of the tubular expansion cone comprises:

an paraboloid body.

51. The system of claim 50, wherein the angle of attack of the outer surface of the paraboloid body increases in a continuous manner from one end of the paraboloid body to the opposite end of the paraboloid body.

52. The system of claim 41, wherein the tubular liner comprises a plurality of expandable tubular members; and wherein the other tubular members are interleaved among the expandable tubular members.

53. The system of claim 41, wherein one or more of the perforated tubular members include an elastic sealing member coupled to an exterior surface of the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

54. A method of isolating subterranean zones traversed by a wellbore, comprising:

positioning a tubular liner within the wellbore; and

radially expanding one or more discrete portions of the tubular liner into engagement with the wellbore;

wherein the tubular liner comprises a plurality of tubular members; and

wherein one or more of the tubular members are radially expanded into engagement with the wellbore and one or more of the tubular members are not radially expanded into engagement with the wellbore; and

wherein the tubular liner comprises:

one or more expandable tubular members that each comprise:

a tubular body comprising an intermediate portion and first and second expanded end portions coupled to opposing ends of the intermediate portion; and

a sealing member coupled to the exterior surface of the intermediate portion; and

one or more perforated tubular members coupled to the expandable tubular members;

wherein the inside diameters of the perforated tubular members are greater than or equal to the maximum inside diameters of the expandable tubular members.

55. The method of claim 54, wherein the tubular liner comprises a plurality of expandable tubular members; and wherein the perforated tubular members are interleaved among the expandable tubular members.

56. The method of claim 54, wherein one or more of the perforated tubular members include an elastic sealing member coupled to an exterior surface of the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

57. An apparatus for isolating subterranean zones, comprising:

a subterranean formation defining a borehole; and

a tubular liner positioned in and coupled to the borehole at one or more

discrete locations;

wherein the tubular liner comprises a plurality of tubular members; and

wherein one or more of the tubular members are radially expanded into engagement with the borehole and one or more of the tubular members are not radially expanded into engagement with the borehole; and

wherein the tubular liner is coupled to the borehole by a process that comprises:

positioning the tubular liner within the borehole; and

radially expanding one or more discrete portions of the tubular liner into engagement with the borehole.

58. The system of claim 57, wherein prior to the radial expansion the tubular liner comprises:

one or more expandable tubular members that each comprise:

a tubular body comprising an intermediate portion and first and second expanded end portions coupled to opposing ends of the intermediate portion; and

a sealing member coupled to the exterior surface of the intermediate portion; and

one or more perforated tubular members coupled to the expandable tubular members;

wherein the inside diameters of the perforated tubular members are greater than or equal to the maximum inside diameters of the expandable tubular members.

59. The system of claim 58, wherein the tubular liner comprises a plurality of expandable tubular members; and wherein the perforated tubular members are interleaved among the expandable tubular members.

60. The apparatus of claim 57, wherein one or more of the perforated tubular members include a tubular elastic sealing member coupled to an exterior surface of the perforated tubular member and covering one or more of the perforations of the perforated tubular member.

61. A method of sealing an annulus between a wellbore and a tubular member positioned within the wellbore, comprising:

coupling a swellable elastomeric material to the exterior of the tubular member that swells in the presence of fluidic materials to sealingly engage the wellbore.

62. The method of claim 61, further comprising:

radially expanding and plastically deforming the tubular member within the wellbore.

63. The method of claim 61, wherein the tubular member defines one or more radial passages.

64. The method of claim 63, wherein the swellable elastomeric materials covers and seals one or more of the radial passages of the tubular member.